

EXHIBIT 3 (PART 2)

In The Matter Of:

*Honeywell International Inc., et al. v.
Hamilton Sundstrand*

*Trial Volume Number 4
February 8, 2001*

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you got to that job. Your [24] current position is product line director; is that

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[1] right?

[2] A: Yes. Product line director in [3] Honeywell's commercial APU business unit.

[4] Q: Okay. And can you tell the jury your [5] role and responsibilities as the product line [6] director?

[7] A: Yeah. I'm the product line director for [8] a group of APUs, the 131-9 family of APUs. It [9] consists of the 131-9A, the A designation being [10] for the Airbus 320; the 131-9B with the B [11] designation being for the Boeing 737; and the [12] 131-9D with the D designation being for McDonnell [13] Douglas, D meaning Douglas.

[14] I'm also responsible for the 331-300 [15] APU, which the jury has heard in previous [16] testimony is the APU for the Airbus A330 an A340 [17] aircraft as well as an APU that's the 331-400, [18] which is for Boeing's 767-400 aircraft.

[19] Q: Now, when you say in that answer that you [20] are responsible for all those APUs, give the jury [21] a sense of what those responsibilities entail.

[22] A: As the product line director for that [23] group of products, I'm responsible for the [24] day-to-day as well as the more strategic aspects

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[1] of the product, the financial well-being and [2] success of the product, but as well all of the [3] things that go into that, from the amount of [4] resources that we invest or will invest in [5] engineering to the activities that we're pursuing [6] with customers, whether it be trying to get new [7] business from customers or whether it be talking [8] with customers over issues or potential issues [9] that they may have.

[10] Q: Okay. And I think you said you joined [11] what was then AlliedSignal or maybe even Garrett [12] back in 1985; is that right?

[13] A: The companies had just merged in the [14] period of 1985, AlliedSignal meaning had just [15] merged, and I joined the Garrett Turbine Engine [16] Company, which was a subsidiary of AlliedSignal, [17] in September of 1985.

[18] Q: Now, in what year did you assume your [19] current position as product line director?

[20] A: I assumed my the product line director [21] roll in 1999 and have held it since that time.

[22] Q: And can you give the jury just a brief [23] sense of the positions you held at Honeywell [24] between 1985 and

1999?

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[1] A: Yes, of course. I started in 1985 as an [2] official title being development engineer. It was [3] a product engineer, I'll call it a jack of all [4] trades. I wasn't responsible to be the expert in [5] any one engineering discipline such as [6] aerodynamics or structures on control systems, [7] which you have heard a lot about; rather, I was [8] the coordinator for all of those specialties. And [9] I progressed from say the periods of 1985 and 1990 [10] in roughly the same role but with different titles [11] or grades within that role, becoming eventually a [12] senior development engineer.

[13] In roughly late '89 or early 1990, I [14] won't get very specific with the dates because my [15] recollection is not quite that good, I became the [16] engineering supervisor for a group of project [17] engineers, I think somewhere between six and ten [18] project engineers. During those times I was [19] working in the commercial APU business on a [20] variety of projects including the 331-300 APU, [21] which you see before you, but as well as some of [22] AlliedSignal or Honeywell's other APU products.

[23] And in 1991, indeed when I became an [24] engineering supervisor, I was responsible for the

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[1] 331-200 APU as well as the sister, the 331-250 [2] which goes on one of the Airbus applications.

[3] Then in —

[4] Q: Go ahead. Why don't you, after '91 and [5] between and until your current position in 1999, [6] what did you do at Honeywell?

[7] A: In late 1991 or somewhere in 1992, I [8] became an engineering manager, which was a second [9] level supervisory position responsible for a [10] couple of engineering supervisors and their team [11] that were responsible for the 331-350 APU.

[12] Again, as I mentioned before, the [13] Airbus A330 and Airbus 340 aircraft was one of the [14] applications.

[15] In 1994, I became a program manager [16] and switched from a technical role to more of a [17] business role in organization, and I became the [18] program manager in our Roundheim, Germany facility [19] for the work that Honeywell was doing for Airbus [20] supplying the Airbus APUs. We were actually [21] building and contracting those APUs out of our [22] Roundheim Germany facility for almost all of the [23] work that we were doing for Airbus.

[24] And then in 1997, while still at the

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[1] Roundheim facility in Germany, I took a role as [2] the head of customer support and business [3] development for the Roundheim facility. It's [4] primarily a service facility where we do repair of [5] jet engine APUs and other aircraft products that [6] Honeywell produces for customers in Europe, the [7] Middle East, and Africa. And I was responsible in [8] that business, as I said.

[9] An then in 1999, as I mentioned, I [10] became the product line director located in [11] Phoenix, Arizona.

[12] Q: And you've held that position through to [13] today; is that correct?

[14] A: Yes, that's correct.

[15] Q: All right. Let me move over this chart [16] that was made during Mr. Loranger's testimony.

[17] Can you see that, Mr. Albert, up [18] there?

[19] A: Yes, I can see that.

[20] Q: Now, are you familiar with the [21] marketplace for the Airbus A320 aircraft?

[22] A: Yes, I am.

[23] Q: And I think Mr. Loranger may have said [24] that this seats approximately 150 passengers, that

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[1] sort of size?

[2] A: The Airbus A320 we call a family of [3] aircraft including Airbus A318, Airbus A319; [4] Airbus A320; and Airbus A321. I think for [5] simplicity Mr. Loranger referred to that as the [6] A320. It's one family of aircraft that seats [7] between, oh, about 105 to 110 passengers up to 180 [8] to 185. That's probably as exact as I can get.

[9] Q: Now, if an airline decides to just buy an [10] airplane, like United or Northwest decides it's [11] going to buy a new A320 from Airbus, what APUs are [12] available to go on that airplane?

[13] A: They have a choice of selecting either [14] Honeywell's 36-300 APU, which I believe is the [15] first one there, the Hamilton Sundstrand APS 3200, [16] 36-300 APU, or the Honeywell 131-9A APU.

[17] Q: Can the airline buy an APU for the new [18] A320 from anyone other than Honeywell or Hamilton [19] Sundstrand?

[20] A: There are no other APU models that are [21] available and that have been certified by Airbus [22] and airworthiness authority as well as the [23] manufacturer of that unit. There are no others [24] available for the Airbus A320 family of aircraft.

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[1] Q: If another APU manufacturer wanted to get [2] into the marketplace, could it just go out and [3] start making offers to airline customers like [4] United or American?

[5] A: I think that another manufacturer, should [6] they choose to attempt to enter this market, would [7] face a very long and expensive development period [8] before they would be in such a position.

[9] Q: And to your knowledge, is any manufacture [10] in the process of undertaking that project?

[11] A: To my knowledge, there's no current [12] activity of any other manufacture to develop, [13] design, and certify another APU product for the [14] A320 family of aircraft.

[15] Q: Now, are you familiar with the process by [16] which airline customers decide from which of these [17] three options that are available, decide which one [18] to get with their new A320?

[19] A: Yes. It's part of my current [20] responsibilities as a project line director.

[21] Q: Typically, what's the first step that [22] happens when an airline decides they're going to [23] buy a new A320 with regard to the APU selection?

[24] A: Well, typically, what happens first is

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[1] that the airline chooses to select or to purchase [2] or lease, I guess, a number of A320 family [3] aircraft. We would find out about that either [4] from trade journals, magazines in the aerospace [5] industry, or from sales representatives or what we [6] call account representatives that we have located [7] in various parts of the world and are responsible [8] for day-to-day direct interface with airline [9] customers, for instance.

[10] Q: And what would happen next in the [11] process?

[12] A: What would typically happen next is that [13] we would request an opportunity to provide [14] technical briefing to the airline. We would use [15] that as an opportunity to introduce our products [16] on a very broad basis. And then after that, [17] either at the formal request of an airline or [18] based upon a verbal request of an airline, we [19] would be requested to submit a proposal, a [20] commercial proposal, for providing our APU for [21] their upcoming fleet of A320 family aircraft.

[22] Q: And when you're submitting the proposal, [23] is there anyone else in the marketplace submitting [24] proposals?

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[1] A: Yes, and based on my experience, I know [2] of no cases where Hamilton

Sundstrand or APIC has [3] not also been asked to submit a proposal at the [4] same time that we've been asked to, and base that [5] on feedback from customers.

[6] Q: All right. So in the A320 marketplace — [7] that was stated with two negatives; let me ask [8] that question affirmatively.

[9] Are you aware of any competition in [10] the A320 marketplace which did not involve both [11] Honeywell and Hamilton Sundstrand?

[12] A: No, I'm not aware of any. In the [13] appropriate time period.

[14] Q: Okay. And what happens when you have [15] then this competition between Honeywell and [16] Hamilton Sundstrand to supply the APU for a new [17] A320 aircraft that a customer is buying?

[18] A: After we and Hamilton Sundstrand submit [19] their initial proposals to the airline customer, [20] there's typically three or four maybe even five [21] rounds of iteration discussions with the airline [22] negotiations, with the airlines on the commercial [23] aspects or the business aspects of the proposal [24] before the airline completes their economic

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[1] evaluation and makes a selection.

[2] Q: When you say three or four, three to five [3] rounds of proposals, what does that entail?

[4] A: As the airline — as the airline [5] proceeds with their comparison of Honeywell's [6] offer and Honeywell Sundstrand's offer, they'll [7] typically, in every case that I can recall, [8] they'll request the offers to be improved, our [9] offer to be improved, and that, again, may happen, [10] three, four, five times over a period of at least [11] a month.

[12] Q: And do these competitions sometimes [13] stretch for more than months?

[14] A: Yes, I've known of several competitions [15] that have lasted for more than a year, maybe even [16] two years.

[17] Q: In the course of these competitions with [18] Sundstrand and the APS 3200 APU, does Honeywell [19] sometimes offer price concessions to the airline [20] customers?

[21] A: Yes, we do.

[22] Q: And how does that come about?

[23] A: In every case that I'm aware of, the [24] airlines demand certain economic concessions in

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[1] order to select one product or the other.

[2] Q: And these three to five rounds of [3] negotiations that we mentioned earlier, does that [4] involve these concessions in

any way?

[5] A: It involves exclusively those economic [6] concessions, or very close to exclusively.

[7] Q: Okay. And can you explain to the jury [8] what you mean by it involves almost exclusively [9] those economic concessions?

[10] A: That up front or very early in the [11] process, as I mentioned before, the technical [12] briefing, the airline would have established that [13] the technical, I guess I'll call it the [14] foundation, of those products that both products [15] have been qualified by Airbus or for offer on [16] those aircrafts, and essentially all subsequent [17] discussions between Honeywell and the airline [18] involve the economic or the commercial aspects of [19] the product.

[20] Q: Does it happen that sometimes that the [21] airline customer will say in substance to [22] Honeywell, here's Sundstrand's latest proposal on [23] the APS 3200, can you beat this?

[24] A: Yes, that does happen. During one or

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[1] more of the iterations or rounds.

[2] Q: Okay. Now, remember we've used in the [3] questioning this term concessions, and I want to [4] make that a little bit more concrete. Did you [5] help prepare a demonstrative exhibit to help with [6] some of the types of concessions?

[7] A: Yes, I have.

[8] Q: Ad let me move the chart and have [9] Mr. Schlaifer put that demonstrative up.

[10] Mr. Albert, can you, before we go [11] through them one by one, tell the jury generally [12] speaking what they're looking at?

[13] A: This is a listing of the most typical [14] concessions, meaning economic benefits, that [15] Honeywell offers to airlines during the course of [16] A320 selection competitions with the APS 3200 [17] APU.

[18] Q: Okay. Let's walk through them one by [19] one. The first one is cash rebates or payments. [20] That may be somewhat self explanatory, but why [21] don't you explain to the jury what that type of [22] concession is?

[23] A: A cash rebate or payment is, of course, [24] simply writing a check to the customer either on

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[1] an onetime basis, meaning, for instance, when the [2] airline accepts his first A320 family aircraft, or [3] on an aircraft-by-aircraft basis, that delivery. [4]

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[6] Q: So Hamilton Sundstrand Corporation is [7] part of United Technologies Corporation?

[8] A: That's correct.

[9] Q: Can you tell the jury what the other [10] major parts of United Technologies?

[11] A: Well, within United Technologies, [12] Hamilton Standard is part of Flight Systems that's [13] Sicorski.

[14] Q: What is Sicorski?

[15] A: Sicorski is one of the world's largest [16] manufacturers of helicopters for commercial and [17] military applications.

[18] Q: What are the other part of United [19] Technologies?

[20] A: Otis Elevators. I noted the elevators in [21] this building are Otis elevators.

[22] Q: I don't think that's something they want [23] to brag about.

[24] A: We also have Carrier Air Conditioning.

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[1] And of course our biggest division is Pratt & [2] Whitney, which manufacture many of the very large [3] gas turbine engines that power commercial and [4] military aircraft.

[5] Q: Let's focus on the Hamilton Sundstrand [6] Corporation today, Mr. Johanson. Can you tell the [7] jury its principal products that it makes?

[8] A: We're a very diversified company. We [9] have one of our larger divisions is the Electric [10] Power Group and they produce the electric power [11] generation equipment virtually every aircraft made [12] in the free world and many, many military [13] applications as well.

[14] In our division of course we [15] produced APUs as you've heard plenty of today. We [16] also produce in our division, cooling fans, oxygen [17] generating systems and within the mechanical [18] division we produce a number of things like gear [19] boxes, main engine starters, actuation devices [20] that actually move the control surfaces on the [21] aircraft and many of the equipment that hang on [22] the outside of an engine both APUs and main [23] engines.

[24] We're also, we have an air — or

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[1] space and undersea division which produces for [2] underwater torpedo engines. And for in space, we [3] produce space suits. The astronauts that are out [4] in space today have Hamilton Sundstrand space [5] suits, so as they're doing their spacewalks.

[6] Q: How about the Space Shuttle Atlantis, [7] that got them to space today, is

there any [8] Hamilton Sundstrand product used on the Space [9] Shuttle?

[10] A: Yes, we do. In addition to space suits, [11] we have also the emergency power units that are on [12] board the Space Shuttle in case they have a power [13] loss.

[14] We have some, I think, three or four [15] of those units on board the Space Shuttle.

[16] Q: Approximately how many employees does [17] Hamilton Sundstrand have today, Mr. Johanson?

[18] A: We're about 17,000 worldwide.

[19] Q: Where are the principal locations where [20] those people work for Hamilton Sundstrand in the [21] United States?

[22] A: For myself, San Diego. We have [23] manufacturing facilities in Windsor Locks is where [24] we're actually headquartered, Windsor Locks,

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[1] Connecticut. We have manufacturing facilities in [2] Puerto Rico, Nebraska, Illinois, Colorado. I'm [3] sure there are others, they just don't occur to [4] me.

[5] Q: In addition to facilities in the United [6] States, does Hamilton Sundstrand also have [7] facilities outside the US?

[8] A: Yes, as I mentioned, we're a worldwide [9] corporation. We have facilities in Italy, we have [10] facilities in China, France, United Kingdom, [11] Singapore, I believe in Japan as well.

[12] Q: Has Hamilton Sundstrand received any [13] awards for its work on airplane equipment?

[14] A: In what aspect?

[15] Q: Anything from Boeing?

[16] A: Yes. I'm sorry. We have from time to [17] time some of our original equipment manufacturers [18] such as Airbus or Boeing. They do honor their [19] suppliers, or airlines suppliers for the support [20] they've provided in either supporting the product [21] or the quality of the product that they deliver, [22] or the timeliness of their correspondence and [23] Sundstrand has received awards from Boeing.

[24] And I believe also from American

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[1] Airlines and Delta Airlines within the last 12 to [2] 24 months.

[3] Q: What award did it get from Boeing in the [4] year 2000?

[5] MR. KRUPKA: Your Honor. [6] Objection. I don't have — I object to background [7] about if we get into specifics, I object.

[8] THE COURT: Do you want to [9] rephrase?

[10] BY MR. ZIEGLER:

[11] Q: Are you aware of an award that Hamilton [12] Sundstrand received in the year 2000 from Boeing?

[13] A: Yes. We received a Supplier of the Year [14] Award.

[15] Q: Now, Mr. Johanson, could you describe for [16] the jury — withdrawn. You've described a number [17] of different products that Hamilton Sundstrand [18] manufactures. Let's now focus on auxiliary power [19] units.

[20] Does Hamilton Sundstrand manufacture [21] auxiliary power units for aircraft.

[22] A: Yes, we have. We have been in the gas [23] turbine engine for 24 years.

[24] Q: Focusing on the current day, what are the

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[1] different airplanes for which Hamilton Sundstrand [2] manufacturers auxiliary power units, putting [3] military ones aside for the moment?

[4] MR. KRUPKA: Objection, Your Honor.

[5] THE COURT: See counsel at [6] sidebar.

[7] (Side-bar conference.)

[8] THE COURT: What's the basis of the [9] objection, Mr. Krupka?

[10] MR. KRUPKA: The objection is that [11] during the course of discovery they took the [12] position that no APU other than the APS 3200 accused [13] product had any relevance to any issue in this [14] lawsuit.

[15] As Your Honor will recall, there was [16] a narrow accepting that Your Honor agreed to, [17] actually the parties agreed to in the presence of [18] Your Honor with respect to a single unit at the [19] pretrial conference.

[20] Having taken the position that all [21] other APUs are irrelevant, we object on relevancy [22] and prejudice grounds that since we have had no [23] opportunity to take any discovery or receive any [24] discovery on any APUs other than the APS 3200, I

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[1] object to having this witness testify about any [2] APU other than the APS 3200.

[3] I didn't mind the general background [4] that described the business, but as soon as we got [5] into specific models, I feel I'm prejudiced [6] because I have no discovery on it and they took [7] the position it was irrelevant.

[8] THE COURT: Mr. Ziegler.

[9] MR. ZIEGLER: Your Honor, this is [10] background information. I'm not going to be [11] eliciting anything about the technical features of [12] any —

involved in negotiating these deals and we [24] don't get into any of the conclusions or opinions

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[1] or experience he has with respect to any [2] particular APU or any particular sole source [3] contract, and we don't get into any of the [4] discussions about when we are negotiating a sole [5] source deal, this is what I do, this is what [6] happens and that this is what our experience has [7] been, which I'm precluded from cross-examining.

[8] I have no problem, Your Honor, as [9] long as you're talking about well, I'm involved in [10] negotiations and some of them are in dual source [11] situations against Honeywell and some of them are [12] in sole source situations, as long as it doesn't [13] go into any of the details or description of what [14] happens in these other deals that we've been [15] precluded from get any discovery on because they [16] took the position they were irrelevant, I don't [17] have a problem.

[18] But as soon as we get into well, [19] what's your experience been on the basis of these [20] other deals or a comparison of his other deals to [21] the APS 3200, then I have a prejudice because I'm [22] not able to cross-examine him with respect to [23] those other experiences because they took the [24] position those documents were irrelevant.

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[1] **THE COURT:** To that extent, I'm [2] going to sustain the objection. Okay.

[3] And give you lead to try to [4] accomplish your task without resorting to that [5] level of detail. Okay?

[6] **MR. ZIEGLER:** Thank you.

[7] **MR. KRUPKA:** Thank you, Your Honor.

[8] (End of side-bar conference.)

[9] **THE COURT:** You may continue, [10] Mr. Ziegler.

[11] **MR. ZIEGLER:** Thank you, Your [12] Honor.

[13] **BY MR. ZIEGLER:**

[14] **Q:** Mr. Johanson, could you describe to the [15] jury briefly the history of Sundstrand's entry [16] into the APU markets?

[17] **A:** The original APU or small gas turbine [18] engine was designed by a company that Sundstrand [19] actually later acquired called Turbomeca, back [20] before that the parent company was solar [21] turbines.

[22] They built their first small turbine [23] engine in 1957. It actually powered a US Navy [24] gyrocopter.

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[1] Subsequent to that they started in [2] the business with APUs that were put on military [3] helicopters and generator sets, just about every [4] US military helicopter in the '60s and 70's had a [5] solar Turbomeca APU in the back and we provided [6] those APUs to start the main engines and provide [7] power in the aircraft.

[8] Later on in the 70's, we got on [9] board the F 16 program and provided to, actually [10] to Sundstrand at that time, the jet fuel starter [11] so that the F 16 has a way to start the main [12] engine.

[13] It's the only source of starting [14] power for that main engine. And I think we've [15] delivered well in excess of 3,000 of those units.

[16] Around 1985, we were acquired by [17] Sundstrand and merged into the Sundstrand [18] Aerospace division. And we continued to develop [19] military and commercial APUs.

[20] About 1987, we got into the larger [21] commercial engines, we were moving into regional [22] transport aircraft and then subsequently we were [23] looking at the larger aircraft to broaden our [24] commercial business, which started off with a 737

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[1] and that was the APS 2000 APU. Subsequently, the [2] APS 3200 and a number of other military APUs as [3] well.

[4] **Q:** Can you explain to the jury what led [5] Sundstrand to decide to develop the APS 3200 for [6] use on the Airbus A320 airplane?

[7] **A:** Well, if we back up just a little bit, we [8] had been looking at the APS 2000 as a commercial [9] APU, and the opportunity came that there was a [10] problem with the incumbent supplier on that [11] aircraft to the extent that a major European [12] carrier came to us and asked us if we would [13] develop an APU and put it on Boeing 737, that [14] airline was Lufthansa.

[15] And we came to an agreement with [16] Boeing and eventually became a second source on [17] that airplane with our APS 2000.

[18] During that period the Airbus A320 [19] had also entered commercial service, I think that [20] was around 1988. And again, there were problems [21] and a great deal of customer dissatisfaction, and [22] we saw an opportunity there to create a new and [23] better product and we did that.

[24] **Q:** When you say there were problems and a

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[1] great deal of customer dissatisfaction,

[2] Mr. Johanson, what were you referring to?

[3] **A:** The unreliability of the APU, the [4] incumbent was the 36-300. And I think we saw [5] excerpts from Aviation Week articles that [6] evidenced the fact that the airlines that were [7] operating it were unhappy with its performance.

[8] **Q:** Just for clarity, who was manufacturing [9] the 36-300 APU that you've just been describing?

[10] **A:** Currently the name of the company is [11] Honeywell.

[12] **Q:** And when was it that customer [13] dissatisfaction with Honeywell's 36-300 came to [14] Sundstrand's attention?

[15] **A:** Early 1989.

[16] **Q:** And what did Sundstrand determine to do?

[17] **A:** What we did is we examined the [18] possibility of developing an APU of that size, and [19] we decided it was quite an expensive project so we [20] went and searched for a partner.

[21] **Q:** And what was the reason for attempting to [22] find a partner to develop the APS 3200?

[23] **A:** The cost of developing one of these units [24] is very, very high. We felt that we needed to,

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[1] number one, have someone who would share the cost [2] of that development, and number two, it was a [3] European designed aircraft, manufactured in [4] Toulouse, France by a consortium of European [5] countries.

[6] So European content was a very [7] important factor in being able to compete for that [8] airplane.

[9] **Q:** What was the company that Sundstrand [10] decided to team up with to make the 3200?

[11] **A:** It was Turbomeca, that's a division of [12] Labinal.

[13] **Q:** Is that a French company?

[14] **A:** Yes, it is.

[15] **Q:** What was your position — well, [16] withdrawn.

[17] What was the name of the joint [18] venture that Turbomeca and Sundstrand created?

[19] **A:** Auxiliary Power International [20] Corporation, which everyone commonly calls APIC.

[21] **Q:** Did you have a position with APIC, [22] Mr. Johanson?

[23] **A:** Yes, I was marketing manager.

[24] **Q:** When did you become marketing manager for

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[1] APIC?

[2] A: The joint venture was actually [3] incorporated in 1989 and at that time Sundstrand [4] placed me in the joint venture company.

[5] Q: What was APIC's operative in designing [6] and marketing the APS 3200?

[7] A: Well, the operative was to provide a more [8] reliable product for Airbus industry customers.

[9] Q: For customers of the A320?

[10] A: Right, A320 family.

[11] Q: How did it go about attempting to design [12] and produce a more reliable product than the [13] Honeywell product?

[14] A: We first started off with a design [15] evaluation process where we studied several [16] possibilities in terms of configuration, and [17] finally selected a load compressor APU.

[18] Q: And were there any features of the 3200 [19] that were intended to improve its reliability over [20] the competition?

[21] A: Yes. We incorporated a two stage axial [22] turbine and many other Sundstrand and Turbomeca [23] designs that we felt were state-of-the-art.

[24] Q: What was the cost to the two companies of

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[1] developing the APS 3200?

[2] A: I think to date we've spent in excess of [3] \$70 million on this product.

[4] Q: Is that a number associated with the [5] development cost?

[6] A: The development cost and then we continue [7] to obviously perfect the product, spend our own [8] money on it. To date we've continued to invest in [9] it to make product improvements.

[10] Q: At the time that Sundstrand teamed up [11] with Turbomeca back in 1989, at the time APIC was [12] created, had the two companies decided how they [13] were going to divide the labor as to which company [14] was going to do which part of the design and [15] development of the 3200?

[16] A: No, we had not.

[17] Q: Was it any part of Sundstrand's decision [18] to team up with Turbomeca to take advantage of [19] Turbomeca's work on designing a load compressor [20] for Garrett at that time?

[21] A: No. In fact, what we had teamed up with [22] Turbomeca for was the expertise they had in the [23] back end of the engine, which was turbine design.

[24] Q: Mr. Johanson, does Hamilton Sundstrand

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[1] make a profit from the sale of the APS 3200 from [2] the price it gets in ex-

change for selling the [3] 3200?

[4] A: No, we do not.

[5] Q: How do you make any money from selling [6] it?

[7] A: We make money through providing [8] aftermarket services to airline operators that [9] take our equipment.

[10] Q: Could you explain to the jury what you [11] mean by "aftermarket services"?

[12] A: Repairs, contracted services, power by [13] the hour agreements, you've heard it referred to [14] as MSA, there is a number of different terms, but [15] generally to provide repair and spares.

[16] Q: When Hamilton Sundstrand enters into a [17] contract — well, withdrawn.

[18] Have you personally met with airline [19] customers to attempt to sell them the APS 3200?

[20] A: Yes, I have.

[21] Q: Approximately how many occasions?

[22] A: More than a hundred.

[23] Q: And in selling the APU to the airline, in [24] the contract, what else, if anything, is being

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[1] sold to the airline?

[2] A: In addition to the APU?

[3] Q: Yes.

[4] A: What we provide, the support services, [5] guarantees, sometimes support to set up overhaul [6] and repair.

[7] Q: What portion and what portion of the [8] services that Hamilton Sundstrand is selling in [9] those contracts is the portion that it expect to [10] get a profit from?

[11] A: The aftermarket, the spare parts or [12] repair services.

[13] Q: Now, is there competition for the [14] aftermarket services for commercial auxiliary [15] power units?

[16] A: Yes, there are many facilities that [17] actually repair APUs and have the capability of [18] doing that.

[19] Q: And are those companies other than [20] Honeywell and Hamilton Sundstrand?

[21] MR. KRUPKA: Objection, Your Honor, [22] to the extent that the question calls for an [23] answer beyond the scope of the APS 3200.

[24] THE COURT: Sustained.

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[1] A: Repeat the question, please, sir.

[2] Q: Are there companies that provide [3] aftermarket repair services with re-

spect to the [4] APS 3200?

[5] A: Yes. We do have airlines, Lufthansa, [6] Holland Pond. There are other repair agencies [7] that I think would like to be in the repair [8] business of our products. We're setting up today [9] Fin Air and Savina engine shops as well.

[10] They are — they'll probably be up [11] and running this year. And I have a project going [12] at US Airways right now to set up a repair shop.

[13] Q: With respect to the availability of [14] third-party repair companies, is that something [15] that requires a substantial investment by those [16] third-party companies or is that something that [17] can be done if there is enough demand for it?

[18] MR. KRUPKA: Objection, Your Honor. [19] Lack of foundation.

[20] THE COURT: Could you establish [21] foundation for the question, Mr. Ziegler?

[22] BY MR. ZIEGLER:

[23] Q: Mr. Johanson, are you familiar with the [24] repair facilities that are available in the

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[1] commercial APU market?

[2] MR. KRUPKA: Objection, Your Honor, [3] to the extent that the question calls for [4] something beyond the APS 3200.

[5] MR. ZIEGLER: Your Honor, could I be [6] heard at side-bar?

[7] THE COURT: Yes, you may.

[8] MR. ZIEGLER: Thank you.

[9] (Side-bar conference.)

[10] THE COURT: Yes, Mr. Ziegler.

[11] MR. ZIEGLER: Your Honor, I [12] understood the objection was sustained to the [13] extent of limiting my ability to elicit from him [14] specific information relating to his experience as [15] sole source on other Hamilton Sundstrand APUs, but [16] Mr. Krupka has objected more, that I can't say [17] anything about aftermarket services more generally [18] in the commercial APU market, and I don't know of [19] any objection that's lodged in the country on this [20] subject. [21] I don't think it was ever asked to [22] the underlying basis for the prior objection since [23] it doesn't apply to this line of questioning.

[24] MR. KRUPKA: Your Honor, two points,

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[1] one is that they've limited discovery to the APS [2] 3200, and we were precluded to cross-examining him [3] on that because they didn't produce any [4] information.

[5] Secondly, Your Honor, there is no [6] indication that there is any relevance to the jury [7] to anything having to do with

need them?

[19] THE COURT: Yes, we do.

[20] MR. HERRINGTON: Great.

[21] DIRECT EXAMINATION

[22] BY MR. HERRINGTON:

[23] Q: Mr. Shinskey, would you please introduce [24] yourself to the jury?

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[1] A: Yes. I'm Francis Gregway Shinskey. I am [2] a process control consulting engineer. I am a [3] self-employed engineer operating out of my home in [4] New Hampshire.

[5] I have many years of experience in [6] industry, chemical industry, and instrumentation [7] industry, and have spent since approximately 1957 [8] working in process control exclusively of [9] industrial plants and facilities.

[10] Q: Mr. Shinskey, if you could explain, what [11] is "process control"?

[12] A: Process control involves controlling [13] variables in plants and in machinery so that the [14] plant or the machine operates safely, [15] profitability, meets production objectives.

[16] Q: And does that field include surge [17] control?

[18] A: That field includes surge control, yes.

[19] Q: Surge control of compressors?

[20] A: Of compressors, yes, yes, sir.

[21] Q: And have you, yourself, designed surge [22] control systems?

[23] A: I have.

[24] Q: On approximately how many projects?

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[1] A: Oh, perhaps 20 projects.

[2] Q: Let's go back and review your education.

[3] When did you graduate from college?

[4] A: I graduated from college in 1952 with a [5] degree, bachelors of science and chemical [6] engineering.

[7] Q: Where did you go to school?

[8] A: The University of Notre Dame.

[9] Q: And after receiving your diploma, what [10] did you do?

[11] A: After receiving my diploma, I was [12] commissioned as a naval officer having participate [13] in the ROTC program at the university. And I [14] immediately went to active military duty in the [15] Korean War on a destroyer.

[16] Q: For how long were you in Korea?

[17] A: I was there for two years.

[18] Q: And what did you do when you finished [19] your tour of duty?

[20] A: When I finished my tour of duty, I

joined [21] the DuPont Company in the Savannah River, an [22] atomic energy plant in Georgia.

[23] Q: When did you first begin to work in the [24] field of controls?

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[1] A: From DuPont, I went to work for Olan [2] Chemical in 1955. And after two years working for [3] Olan chemical, and gaining some experience working [4] with controls, repairing them, in fact, I was [5] appointed the instrument engineer for the group of [6] pilot plants which were manufacturing high energy [7] fuels at the Olan facility in Niagara Falls.

[8] Q: For how long did you work at Olan?

[9] A: I work at Olan from 1955 until 1960.

[10] Q: Where did you go after that?

[11] A: When I left Olan in 1960, I began work [12] for the Foxboro Company in Foxboro, [13] Massachusetts. The Foxboro Company is an old line [14] instruments and control systems manufacturing [15] company.

[16] Q: And are you still working in the field [17] today?

[18] A: I still am working in the field today. I [19] retired from the Foxboro Company in 1993, and [20] after retiring, I continued to be actively working [21] in the field of process control. I have very many [22] clients who use my services to help them control [23] their plants.

[24] Q: At some point, Mr. Shinskey, did you

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[1] begin writing about controls?

[2] A: Yes, I did. I found that my education in [3] process control that I was able to obtain did not, [4] while it was interesting to learn the theory of [5] how process controllers behave, I found that the [6] information available from academic sources was [7] not adequate to help me in a plant situation, so I [8] developed my own method for analyzing process [9] control loops and improving the performance of [10] control in plants situations.

[11] So at that point I began instructing [12] the engineers who I was associated with at Foxboro [13] in my methods of achieving better performing [14] control systems.

[15] Q: And when did you first write a book on [16] controls?

[17] A: I was teaching Foxboro engineers in my [18] methods when the — the head of the research [19] department asked me if I would write a book on the [20] subject, which I did, and which my first book was [21] published in 1967. It is not in its

fourth [22] edition.

[23] MR. HERRINGTON: Your Honor, if I [24] may, may I ask Mr. Shinskey to identify his first

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[1] book that he just referred to and we also have the [2] second edition?

[3] THE COURT: You may.

[4] BY MR. HERRINGTON:

[5] Q: I've handed you what we've marked as [6] Defendant's Exhibit 1196 A and B. If you could [7] please, just identify those?

[8] A: Yes, 1196 A is the first edition of [9] process control systems published in 1967. And [10] Exhibit 1196 B is a second edition which was [11] published in 1979.

[12] Q: And what is the general subject of those [13] books?

[14] A: They go through the theory of process [15] control, how controllers function. And how to [16] achieve the best performance out of control [17] loops. They describe controllers of various kinds [18] and then they concentrate specifically on [19] controlling different types of processes, pumps, [20] compressors, heat exchangers, boilers, [21] distillation columns, all the variety of processes [22] that you would find in a more than processing [23] plant.

[24] Q: Do they contain some discussion of surge

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[1] control of compressors?

[2] A: Yes, they do contain a discussion of [3] surge control.

[4] Q: Now, in addition to your books, is it [5] fair to say you've also written articles over your [6] career?

[7] A: I have written, as was mentioned, more [8] than 100 articles on process control, yes.

[9] Q: I don't want to embarrass you, but you've [10] received awards throughout your career from the [11] Instrument Society of America, the American [12] Institute of Chemical Engineers, the Institute of [13] Measurement and Control of the United Kingdom, the [14] Nordic Process Control Group and the American [15] Automatic Control Council?

[16] A: That's correct.

[17] Q: And I understand that this spring you're [18] to be inducted into the Control Hall of Fame?

[19] A: That's correct.

[20] Q: Mr. Shinskey, you've also had occasion to [21] teach controls to other engineers?

[22] A: Yes, I have participated, I have given [23] many, many seminars over the

years since my — I [24] began writing, I also began giving seminars and I

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[1] have given, on the average, of five to six [2] seminars a year, perhaps more than that in some [3] years, since about the last 30 or 35 years.

[4] Q: Now, one of the issues in this case is [5] what a person of ordinary skill in the art to [6] which the Honeywell patents apply would understand [7] and be able to do.

[8] And, I believe you have an [9] understanding of what you think a person of [10] ordinary skill in the field would be?

[11] A: Yes. A person of ordinary skill in the [12] art in this field would be someone with a degree [13] in engineering, would have perhaps five or more [14] years experience in applying control systems to [15] industrial plants and facilities. And some of [16] those control systems would be associated with [17] controlling compressors.

[18] Q: Now, based on your own experience as of [19] the time period of February 1980 and the late [20] 1970's, would you have an understanding of what [21] would be known and understood by a person of [22] ordinary skill in this field?

[23] A: Yes. Back at that period of time I would [24] have been that person of ordinary skill and my

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[1] colleagues at Foxboro Company, my colleagues in [2] industry with whom I worked, and also the students [3] that came to me for training in advanced control [4] systems would have been representative of persons [5] of ordinary skill in the art.

[6] Q: Mr. Shinskey, I want to discuss the [7] patents and the APS 3200, but before we do that, I [8] would like to give you an opportunity to give the [9] jury a brief tour, if they like, of the APS 3200.

[10] MR. HERRINGTON: Your Honor, may I [11] ask the jury would step down? We have it over [12] here.

[13] THE COURT: Chance to stretch your [14] legs, ladies and gentlemen.

[15] BY MR. HERRINGTON:

[16] Q: Please.

[17] A: Now, as the previous witness had [18] mentioned this is not an operating APU, but it is [19] a mock up, but it is of the same size, weight, and [20] so forth. It's made of the same parts that would [21] be an operating APU.

[22] We have at the far end is the [23] engine, the external engine which spins the [24] turbine blades and so forth, and the parts powered

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[1] to the shaft, T shaft turns both the power [2] compressor which is on this side and the load [3] compressor which is on this side.

[4] Air for this machine is drawn up [5] from underneath, there is a large opening, the air [6] comes vertically upward from openings underneath [7] and spins around in the load compressor and is [8] discharged right at this point.

[9] Now, at this point, the air can go [10] in two different directions. The compressed air [11] enters the bleed control valve at this point and [12] the bleed control valve can either send air to the [13] aircraft or to the exhaust.

[14] And it has a what we call a [15] butterfly valve, which can swing from left to [16] right and close off either one port or partially [17] close off the other port.

[18] The valve is operated by an electric [19] hydraulic actuator right here which receives a [20] signal from the surge control system in order to [21] adjust its position in one direction or the other.

[22] The guide vane operator is this [23] motor right here. And as the guide vane operator [24] is — receives a signal, it moves its shaft in and

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[1] out which opens or closes the louvers, the guide [2] vanes that you have seen in the other compressor.

[3] The additional features, there is [4] the generator at this end, and of course the [5] exhaust is over here, and whatever air is not [6] delivered to the aircraft goes here because the [7] aircraft demand might be less than the surge limit [8] for the compressor, whatever additional air beyond [9] what is required by the aircraft, then is bled to [10] the exhaust through the bleed surge control.

[11] Q: Thank you.

[12] MR. HERRINGTON: Your Honor, [13] Mr. Shinskey has prepared a set of digital aids [14] that I would like to show him and then present to [15] the jury if I may.

[16] THE COURT: You may.

[17] MR. HERRINGTON: Would you like [18] copies for the Court?

[19] THE COURT: Yes.

[20] MR. HERRINGTON: Three?

[21] THE COURT: Two.

[22] MR. KRUPKA: Your Honor, may we have [23] a side-bar.

[24] THE COURT: Yes, I'll join counsel

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[1] at side-bar.

[2] (Side-bar conference.)

[3] MR. KRUPKA: I'll let Mr. Putnam do [4]

it.

[5] MR. PUTNAM: Your Honor, I gather [6] Mr. Herrington's intent is to give these [7] demonstratives to the jury, which we would object [8] to assuming that they have all been disclosed [9] before and we need to look through — I don't have [10] any objection him showing them to the jury, but I [11] think having the jury have them in their [12] possession, even if it's just during the course of [13] Mr. Shinskey's testimony would be prejudicial. [14] They are not evidence, they can illustrate his [15] testimony. I don't think it's appropriate that [16] copies be given to the jury.

[17] MR. ZIEGLER: Your Honor, it's just [18] at way of letting them follow along. It's a small [19] version.

[20] THE COURT: Are these going to be [21] displayed?

[22] MR. HERRINGTON: Yes, in addition to [23] being displayed.

[24] THE COURT: Just display them, to

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[1] avoid any further dispute.

[2] MR. HERRINGTON: Okay.

[3] (End of side-bar conference.)

[4] THE COURT: Members of the jury, [5] we'll just have them displayed for your benefit on [6] the screen as we did before.

[7] BY MR. HERRINGTON:

[8] Q: Mr. Shinskey, I want to turn now to the [9] question of whether the APS 3200 infringes the two [10] patents at issue in this case, the '893 and '194 [11] patent.

[12] Did you conduct an evaluation of [13] that issue?

[14] A: I did.

[15] Q: And did you reach a conclusion?

[16] A: I definitely reached a conclusion, yes.

[17] Q: What was your conclusion?

[18] A: My conclusion is that the APS 3200 surge [19] control system does not infringe either the '893 [20] or the '194 patents.

[21] Q: If you could, please explain, just [22] briefly, what the basis for your opinion is?

[23] A: If we look closely at all of the claims [24] of the two patents, we find that in every claim is

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[1] the feature of adjusting the set point of the [2] surge controller as a function of inlet guide vane [3] position, or of changing the proportional integral [4] output signals are the source of the controller [5] signal as a function of inlet guide vane position.

[6] In the APS 300, the guide vane [7]

position is neither used to set the set point of [8] the surge controller nor does it affect the [9] proportional and integral outputs of the surge [10] controller in any way.

[11] Q: Mr. Shinskey, I would like to give you [12] copies of the patents?

[13] MR. HERRINGTON: Your Honor, if I [14] may?

[15] THE COURT: Yes.

[16] Q: What we call the '893 patent is [17] Defendant's Exhibit 2, and the '194 patent is [18] Defendant's Exhibit 3.

[19] Mr. Shinskey what did you do to [20] familiarize yourself with these patents and the [21] claims at issue?

[22] A: Well, I read the patents and their claims [23] in close detail. And in light of my experience in [24] controlling surge in various compressors over the

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[1] years, and also in light of what was considered to [2] be the state-of-the-art at the time prior to the [3] filing of these patents.

[4] And I was surprised to find out that [5] the elements of the claims upon which the patents [6] depend were commonly practiced, not only singly, [7] but also in combination, in combinations similar [8] to the combinations which appear in the patents at [9] that time.

[10] For example, the flow related [11] parameter is a very common flow related parameter, [12] which was used to measure the flows of compressed [13] air and gas in many, many applications, not only [14] surge control back at this period of time.

[15] And so I was somewhat surprised that [16] these patents were even granted.

[17] Then after having familiarized [18] myself with all of the characteristics of the [19] control systems as described in the patents, then [20] I investigated the way surge control was provided [21] in the APS 3200.

[22] And I found some, again, very [23] unusual differences. For example, I discovered [24] that the inlet guide vane position in the 3200

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[1] does not set the set point of the surge controller [2] as it does in the patents.

[3] I also discovered that the variable [4] used by the surge controller in the APS 3200 is [5] not the same variable as the flow related [6] parameter in the patents, it's quite different.

[7] In fact, the surge variable, the [8] variable which is used to control surge in the APS [9] 3200, I discovered that I had never seen that used [10] to control surge before in any work that I had [11] ever done or in any publications that I have

ever [12] read.

[13] That is the use of the pressure rise [14] across the diffuser as an indication of the [15] approach to surge in a compressor.

[16] Q: Mr. Shinskey, what did you look at to [17] become familiar with the operation of the APS [18] 3200?

[19] A: I looked very thoroughly through the [20] specification. What we have talked about earlier [21] is the ECB or Electronics Control Box requirement [22] specification for the APS 3200, which describes [23] the — in block diagram form and also in text how [24] the control system for the APS 3200 functions.

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[1] MR. HERRINGTON: Your Honor, if I [2] may show Mr. Shinskey what's been marked as [3] Defendant's Exhibit 26?

[4] THE COURT: You may.

[5] BY MR. HERRINGTON:

[6] Q: Mr. Shinskey, if you could, please, [7] identify what we have marked here as Defendant's [8] Exhibit 26?

[9] A: Yes, this is the APS 3200 ECB [10] requirements specification, revision N. This is [11] the same document I was using.

[12] Q: Before we talk about what the patents [13] claim and what the APS 3200 does, could you give a [14] brief summary of how a surge control system works?

[15] A: I believe I can.

[16] A surge control system in order to [17] prevent surge from developing in a compressor, the [18] surge control system has to maintain at least a [19] certain minimum flow through the machine.

[20] And the difficulty that we have in [21] controlling a surge in a compressor is that the [22] particular value of minimum flow which will be [23] safe as far as surge goes is not a constant. It [24] varies with many different things. It varies with

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[1] the compression ratio of the compressor. It [2] varies with the speed of the compressor. With the [3] opening of guide vanes. It varies with the [4] composition of gas which is being compressed, and [5] also with the temperature of the gas being [6] compressed.

[7] And so it's a fairly complicated [8] science to be able to arrive at an effective surge [9] control system for a compressor. And the control [10] system which is best for a given compressor may [11] not be best for another because compressors vary [12] based on again whether we have a constant speed, [13] variable speed, inlet guide vanes or not, whether [14] the system pressure is constant temperature, gas [15] composition and so forth.

[16] Q: Is a surge control system an example of a [17] closed loop system?

[18] A: A surge control system is a closed loop [19] system, yes.

[20] Q: We have a figure from your 1967 book. [21] And if we can project it on the screen and have [22] you explain the basis of a closed loop [23] controller.

[24] MR. HERRINGTON: Your Honor, may the

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[1] witness approach the board here?

[2] THE COURT: Yes.

[3] A: This is the simplest example of a closed [4] loop. And I would like to identify the inputs and [5] outputs to the controller.

[6] We have an input entering from the [7] right, which is identified as the set point. And [8] as we have defined the set point in the last few [9] days, it is the desired value of the variable [10] which we wish to control.

[11] And if we would like the temperature [12] in our home to be 68 degrees, we would set the set [13] point of the thermostat at 68 degrees.

[14] On the other side of this circle [15] entering from the top, we have what we would call [16] the controlled variable. And for the thermostat [17] in our house that would be the temperature of the [18] room would be the controlled variable which we [19] would wish to be maintained at set point.

[20] In the case of a surge control [21] system, the set point is whatever value of the [22] controlled variable, be it flow or whatever we're [23] using as a controlled variable. That would [24] represent a safe condition and still an economic

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[1] condition. A safe condition means we're not going [2] to go into surge. We are protected from surge by [3] maintaining that value, an economic condition [4] means that we would not waste compressed air [5] unnecessarily by operating far away from surge.

[6] Then the comparison between the [7] controlled variable and the set point is developed [8] here in this circle then is what we might call a [9] comparator.

[10] The difference between the [11] controlled variable and the set point is the error [12] signal. And it has been called the error signal [13] and it appears that way in other documents which [14] we have looked at this week.

[15] The controller acts in such a way as [16] to try to maintain the error as close to zero as [17] possible. So the controller is where the [18] proportional and integral actions will take place.

[19] The output of the controller will [20]

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Hamilton Sundstrand*

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[15] So if the aircraft is sitting on the [16] tarmac at a certain temperature, then a certain [17] set point is produced and sent to the controller.

[18] Now, the guide vanes can move all [19] over as demanded by the control system in the [20] aircraft and still that will have no affect on [21] this set point. This set point will remain at [22] whatever value is programed into it as a function [23] of the existing temperature on the field.

[24] So, again, the temperature is a

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[1] substitute for IGV position. It's not added over [2] and above, it is separate and replaces the IGV [3] position in functionality of the control system.

[4] Q: Thank you.

[5] Why don't we talk now about the [6] reason why IGV position is used at all in the APS [7] 3200. And if you could, please, show chart 35.

[8] Mr. Shinskey, if you could explain [9] what we're seeing here?

[10] A: I believe we covered some of this ground [11] on Friday, but the idea here is that the [12] particular variable which is used, which is [13] controlled in the surge control system for the APS [14] 3200, is DELPQP, which is also called the "static [15] pressure parameter."

[16] And because this only includes flow [17] as a component and flow is not the only variable [18] which it reflects, we discover that at very high [19] flow rates because the compression ratio of the [20] compressor falls at high flow rates, that at very [21] high flow rates this DELPQP measurement falls [22] instead of rising as a flow signal would.

[23] And therefore the possibility exists [24] that DELPQP could fall into a region and

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[1] approaching the set point of the surge controller [2] at very high flow rates.

[3] Under this condition, we're so far [4] away from surge that we do not need to open the [5] surge valve, and so the surge controller has no [6] function in this operating range. And therefore [7] to prevent the surge controller from operating the [8] bleed valve in this range of flows where we know [9] it's not required we have logic, which disconnects [10] the bleed valve from the surge controller, and [11] closes the bleed valve to exhaust, fully open to [12] the aircraft.

[13] Again, its only purpose is to [14] protect against this possibility and it's caused [15] based on the unique characteristic of the DELPQP [16] measurement as a function of flow.

[17] Q: Let me ask you, Mr. Shinskey, does the [18] Honeywell patent, the '893 and

'194 patent, have [19] any discussion at all of a parameter that behaves [20] like this?

[21] A: There is no discussion in the patents on [22] a double value function. There is no discussion [23] on a high flow versus a low-flow mode of [24] operation, or any means used to protect against

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[1] the double valued function interfering with surge [2] control.

[3] Q: Why don't we take a look at what we call [4] the logic in the APS 3200 that was developed to [5] deal with this situation.

[6] If we could have chart 39, please. [7] And Mr. Shinskey, let me ask you [8] first of all, is this a reprint of figure 12a from [9] the ECB specification from the 3200 which is the [10] exhibit?

[11] A: Yes, it is a reprint of figure 12b.

[12] Q: 12b, I'm sorry. You're correct.

[13] If you could please briefly identify [14] the two tests that are used here for dealing with [15] this double solution parameter issue?

[16] A: The first test I'll put a number one [17] here. The first test is whether DELPQP is greater [18] than 0.35. If DELPQP is greater than 0.35, then a [19] logical value of one, and I'll write here "logical [20] one" so you'll know what I mean, logical value of [21] one which means true is sent to the bleed select [22] system to lock out, or lock closed to exhaust the [23] bleed surge control valve, and disconnect the PI [24] controller from operating that valve. That's the

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[1] first test.

[2] Now, if the first test should fail [3] because we have proceeded so far into the high [4] flow region that DELPQP comes back down below .35, [5] if that event were ever to happen, we have a [6] second test, a backup test to protect against the [7] bleed valve being operated by the surge [8] controller.

[9] And that second test is very [10] complicated. It involves calculating what the [11] compression ratio would be if we ever reached that [12] condition.

[13] And we measure the compression ratio [14] and compare it to the compression ratio [15] corresponding to that very high flow condition.

[16] If the compression ratio is less [17] than calculated which would correspond to that [18] high flow condition, then this device puts out a [19] logical one, which then goes through this gate.

[20] Now this, what we call an or gate, [21] which will produce a logical one or true value in [22] its output if either input has a value of one or [23] true.

[24] Now, you may have heard this called

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[1] a comparator. This is not a comparator. The or [2] gate will produce a value of one if either input [3] is one regardless of what the other input is, so [4] the two inputs are not compared at all.

[5] Q: Mr. Shinskey, let me just stop you. You [6] say you may have heard this referred to, I'm not [7] sure it was entirely clear from Mr. Muller's [8] testimony, but if he was referring to this or gate [9] as a comparator, from your understanding as an [10] engineer, is that correct?

[11] A: That's not correct, no.

[12] Q: All right. Let's show chart 35, [13] briefly.

[14] If you can explain on chart 35, is [15] the same logic that we just saw in the double [16] solution curve on the right?

[17] A: Yes.

[18] Q: I want to ask you, I believe Mr. Muller [19] said that the test that uses inlet guide vane [20] position sometimes switches the value of bleed [21] select from zero to one or one to zero, in other [22] words, sometimes switches the system between high [23] flow and low flow.

[24] In your understanding, is that

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[1] correct?

[2] A: No, that's not correct. If we follow the [3] natural progression as flow increases, as flow [4] goes above the set point of the surge controller, [5] which is in this region here, then, of course, the [6] surge controller will close the bleed valve [7] through proportional integral action.

[8] Then as flow continues higher than [9] that, eventually DELPQP reaches this high-flow [10] cutoff point which is this 0.35, at which point [11] the bleed valve has already been closed by the [12] controller, but now the bleed valve is locked [13] close with a constant voltage signal and the [14] controller is disconnected from the bleed valve. [15] Further increasing in flow will bring us up into [16] this area over here.

[17] After the peak has been crossed is [18] where this second or back up test comes into [19] play. It will not function until after the peak [20] is crossed because the falling DELPQP signal on [21] the far side is indicative of a lower compression [22] ratio.

[23] So when the come pressure ratio [24] suddenly starts falling sharply, it indicates

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[1] we're over here. And then this test will produce [2] a logical value of one.

[3] So it never switches between high [4]

ween the DELPQP [2] parameter and operation of the surge bleed valve?

[3] MR. HERRINGTON: Your Honor, I would [4] object. Object to the extent Mr. Putnam is [5] suggesting he's stating the language of element D, [6] he's now departed from the language of element D [7] and asked a different question.

[8] THE COURT: Would you rephrase it, [9] Mr. Putnam? Ask the question again.

[10] BY MR. PUTNAM:

[11] Q: Sure. Won't you agree with me that if [12] the APS 3200 surge control system is in high-flow [13] mode, there is no relationship between the [14] parameter DELPQP and the operation of the surge [15] bleed valve?

[16] THE COURT: Do you have the same [17] objection?

[18] MR. HERRINGTON: Yes, Your Honor.

[19] THE COURT: Let me see you at [20] side-bar.

[21] (Side-bar conference.)

[22] THE COURT: I'm not sure that I [23] understand the basis for the objection.

[24] MR. HERRINGTON: He's got element D

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[1] on the screen and he's acting as if — he seems to [2] be suggesting that he's asking something about [3] what the APS 3200 does would satisfy element D, [4] but he's not referring to element D, he's using [5] different words. He's using subtly changed words.

[6] THE COURT: Go ahead.

[7] MR. PUTNAM: Your Honor, I'm not [8] saying that it's element D, but certainly I can [9] make my argument or ask my questions to this [10] witness to try to suggest that what he will [11] concede based on his deposition the system does [12] meet element D, that's the essence of [13] infringement. It's perfectly proper [14] cross-examination for the witness.

[15] THE COURT: Overruled.

[16] (End of side-bar conference.)

[17] BY MR. PUTNAM:

[18] Q: Mr. Shinskey, let me actually take a step [19] back so we can do this in sequence. First of all, [20] would you agree with me that if the APS 3200 surge [21] control system is in low-flow mode, there is a [22] particular relationship between the 3200's DELPQP [23] parameter and the operation of the surge bleed [24] valve?

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[1] A: I agree with that.

[2] Q: And would you agree with me that if the [3] APS 3200 surge control system is in high-flow [4] mode, there is no relationship between the [5] parameter

DELPQP and operation of the surge bleed [6] valve?

[7] A: That's correct.

[8] Q: And when the APS 3200 surge control [9] system is in low-flow mode, it is the proportional [10] and integral control signals that control the [11] operation of the surge bleed valve; correct?

[12] A: Correct.

[13] Q: And conversely, when the APS 3200 is in [14] high-flow mode, the variations in the value of the [15] parameter DELPQP do not affect the operation of [16] the surge bleed valve; correct?

[17] A: Correct.

[18] Q: And it is by measuring the position of [19] the inlet guide vanes that the APS 3200 surge [20] control system insures that it does not go into [21] low-flow mode when it actually should be in [22] high-flow mode; correct?

[23] A: Correct.

[24] Q: Let me turn to another topic now. And

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[1] that is the question of the flow-related [2] parameter.

[3] Now, the flow-related parameter — [4] let me take a step at a time.

[5] The parameter that the APS 3200 [6] measures is DELPQP; correct?

[7] That's the parameter that it [8] measures, right?

[9] A: Right.

[10] Q: Now, you said, you referred a number of [11] times in your testimony, I think both on Friday [12] and today, to the specific parameter in the [13] Honeywell patents and the specific parameter that [14] Sundstrand uses.

[15] Would you agree with me that none of [16] the six patent claims that are at issue in this [17] trial specify a particular type of flow-related [18] parameter?

[19] A: No, I wouldn't agree with that. As I [20] recall, Claim 8 of the '893 patent specifies a [21] flow-related parameter that was independent of [22] temperature.

[23] Q: That's a fair point and I should have [24] taken that into account.

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[1] Let me address the first five and [2] then come back to Claim 8. And actually [3] Mr. Schlaifer, maybe we can put these up so the [4] jury can see it.

[5] Claim 4 of the '194 patent in clause [6] C just refers generally to a flow-related [7] parameters, correct?

[8] A: Yes.

[9] Q: And maybe, Mr. Schlaifer — it

actually [10] appears three times. So it doesn't say a [11] particular kind of flow-related parameter. It [12] just says the parameter must be related to flow; [13] correct?

[14] A: That's what it says.

[15] Q: And clause — Claim 8 of the '893 patent, [16] Mr. Schlaifer, if you could put that up, please. [17] I think you need to blowup DI. Has this issue as [18] you say, substantially independent of the [19] temperature of the compressed air, but beyond [20] that, it just says a flow-related parameter; [21] correct?

[22] A: That is substantially independent of the [23] temperature of the compressed air, yes.

[24] Q: Yes, sir. It does not talk about a

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[1] specific type of pressure parameter, static [2] pressure or total pressure or anything of that [3] sort; correct?

[4] A: Correct.

[5] Q: And Claim 19 of the '893 patent, which is [6] the other independent or full claim, if [7] Mr. Schlaifer could put that up on the screen, [8] would you confirm for me that what claim 19(b) [9] says is a parameter related to the air flow rate; [10] correct?

[11] A: Yes.

[12] Q: Okay. Would you agree with me, sir, that [13] the APS 3200's DELPQP parameter is related to air [14] flow?

[15] A: The DELPQP parameter is a composite [16] parameter that is related to both flow and [17] compression ratio.

[18] Q: So I think what you're saying is that the [19] DELPQP is related to two things, it's related to [20] flow and it's related in your understanding to [21] compression ratio; correct?

[22] A: Yes.

[23] Q: Let me move to another topic.

[24] And that is the question of where

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[1] the APS 3200 measures these parameters. As I [2] listened carefully, I think that was another one [3] of the issues that you were — or parts of the [4] patent claim that you were maybe taking issue with [5] during your testimony; is that right?

[6] A: That's right.

[7] Q: Okay. In the APS 3200, in the APS 3200 [8] in the Sundstrand product, there is a duct between [9] the compressor and the surge volume, correct?

[10] A: Yes.

[11] Q: What's a duct, is it sort of like a pipe [12] of some sort?

[13] A: It's a pipe.

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of equivalents.

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[1] And as I predicted in my opening [2] statement, I said they were only going to object [3] to a couple of the elements of this claim and that [4] was true. They admitted that they meet some of [5] the elements and they just argued about a couple.

[6] And one of the ones they argued [7] about was element C which talks about a [8] flow-related parameter and whether it gets [9] measured in the duct or not.

[10] And again, we produced expert [11] testimony that this claim was literally [12] infringed. But in addition, we got Mr. Shinskey, [13] their expert, actually Mr. Putnam did, to agree on [14] the 12th of February that the flow-related [15] parameter is DELPQP.

[16] Remember we have DELPQP. We have [17] Delta P over P, and we have various different P [18] over P. Those are the flow-related parameters. [19] We call them different things at different times. [20] But it's basically DELPQP and Delta P over P are [21] the flow-related parameter.

[22] And Mr. Shinskey admitted in [23] response to a question by Mr. Putnam.

[24] QUESTION: So I think what you're

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[1] saying is that the DELPQP is related to two [2] things, it's related to flow and it's related in [3] your understanding to compression ratio; correct?

[4] ANSWER: Yes. [5] There it is in black and white. He [6] admits that it's a flow-related parameter.

[7] Mr. Greubel, this was the guy they [8] brought in, remember, who said he was the one who [9] came up with this. He admitted that Delta P over [10] P is measuring the air flow out of the load [11] compressor on the APS 3200.

[12] Even their specifications say it. [13] Plaintiff's Trial Exhibit 910, the ratio of Delta [14] P over P shall be used as an indication of [15] discharge air flow from the load compressor.

[16] So their own documents — you know, [17] you don't have to worry about which expert do you [18] believe, their own documents and their own [19] witnesses admit it.

[20] Then we have a situation where there [21] is apparently a dispute about whether this is [22] measured in the supply duct, but Mr. Shinskey [23] agreed that Mr. Suttie had said that it was in [24] addition, of course to the testimony of

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[1] Mr. Muller.

[2] Remember, even if they argue, well, [3]

it's not that way all the time, it only does it [4] that way some of the time. Part-time infringement [5] is still infringement. The instructions say [6] that.

[7] Element D, another one of the few [8] disputes that they go through. Mr. Shinskey [9] admitted that the APS 3200 surge control system, [10] this is that one about adjusting the relationship, [11] he stated that the system of the APS 3200 adjusts [12] the relationship between the magnitudes of the [13] integral and proportional control signals and the [14] magnitudes of the parameter variations as a [15] function of the position of inlet guide vanes. [16] That's a mouth full but he admitted that.

[17] Here is the testimony, it's on the [18] 12th of February again at pages 1579 to 1580. In [19] the APS 3200, the surge point is a factor, a [20] function of inlet guide vane position. He [21] admitted that.

[22] So that's proof. [23] Mr. Greubel — maybe we can go on to [24] Mr. Greubel also. I think we made a point with

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[1] respect to that one, please Mr. Schlai-fer.

[2] Mr. Greubel's testimony on the 13th [3] of February where he admits that the inlet guide [4] vanes may affect the parameter Delta P over P [5] that's sensed from the load compressor and [6] measured against the set point, am I correct, [7] sir?

[8] ANSWER: That's correct. [9] So that's literal infringement. We [10] also improved infringement under the doctrine of [11] equivalents.

[12] What's the doctrine of equivalents? [13] The Judge talked about that yesterday. Let's talk [14] about it for a minute. The doctrine of [15] equivalents is a situation where if somebody makes [16] a change that's not substantial, so they're not [17] doing exactly what the claim talks about, but what [18] they do is not substantially different, that's [19] infringement under the doctrine of equivalents.

[20] The whole point of that is to try to [21] avoid having somebody sort of sneak around the [22] edges.

[23] And the law provides that if the [24] differences between what they do and what the

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[1] patent claim calls for are not substantial, then [2] infringement exists under the doctrine of [3] equivalents.

[4] This is in the instructions that you [5] have, number 3.5.3.

[6] Now, did we prove that? [7] Mr. Shinskey on cross-examination again to [8] Mr. Putnam admitted that the difference are not [9] substantial. You just

saw the evidence that Delta [10] P over P or DELPQP is related to inlet guide vane [11] position. The differences are not substantial.

[12] They use a different parameter. [13] They don't use exactly the same parameter that's [14] called for by the claims, but they use the exact [15] same one as far as literal infringement is [16] concerned and they use something that's not [17] substantially different as far as doctrine of [18] equivalents is concerned.

[19] And remember the evidence that the [20] surge point of the APS 3200 is based in part on [21] inlet guide vane position, it's related to inlet [22] guide vane position. So remember we were talking [23] about literal infringement and doctrine of [24] equivalents.

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[1] Mr. Putnam is concerned that [2] Mr. Ziegler may stand up and say, well, you said [3] that, Mr. Shinskey said that, but you didn't [4] show. So why don't we put that up so we can say [5] that we showed it. And I don't want you to think [6] that we're pulling one over on you. It's page [7] 1579.

[8] You had up part of it before and I [9] sort of skipped over it in my enthusiasm.

[10] And I want to — I think that's — [11] can we go back a little bit? I can put it up on [12] the Elmo, right, that way there won't be any [13] dispute about whether I read it properly.

[14] I'll do everything fair and square.

[15] "First of all, would you agree with [16] me that if the APS 3200 surge control system is in [17] low-flow mode, there is a particular relationship [18] between the 3200's DELPQP parameter and the [19] operation of the surge bleed valve?

[20] ANSWER: I agree with that.

[21] QUESTION: And would you agree with [22] me that if the APS 3200 surge control system in [23] the high-flow mode, there is no relationship [24] between the parameter DELPQP and the operation of

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[1] the surge bleed valve — I think that should be [2] bleed valve, not plead valve — that is correct, [3] and when the APS 3200 surge control system is in [4] low-flow mode it is the proportional and integral [5] control signals that control the operation of the [6] surge bleed valve; correct?

[7] ANSWER: Correct.

[8] QUESTION: And conversely when the [9] APS 3200 is in high-flow mode, the variations in [10] the value of the parameter DELPQP do not affect [11] the operation of the surge bleed valve; correct?

[12] ANSWER: Correct.

[13] **QUESTION:** And it is by measuring [14] the position of the inlet guide vanes that the APS [15] 3200 surge control system insures that it does not [16] go into low-flow mode when it actually should be [17] in high-flow mode; correct?

[18] **ANSWER:** Correct. [19] Thank you, Mr. Putnam. Actually, I [20] should probably keep the Elmo on. What I'm going [21] to do is I'm going to show you a copy of what [22] you're going to have in the jury room as the [23] verdict form, I suspect Mr. Ziegler is going to do [24] the same.

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[1] And the first two questions that [2] you're going to be asked are, Has Honeywell shown [3] by a preponderance of the evidence that Hamilton [4] Sundstrand's APS 3200 product literally infringes [5] Claim 4 of the '194 patent?

[6] Now, the one you're getting in the [7] jury room wouldn't have an X there yet. I put [8] that there. Because I think that's the right [9] answer. But that's for you to decide. That's [10] your decision based on the evidence, based on what [11] you think is right, but I thought I would at least [12] put up there my position.

[13] And on the second question, Has [14] Honeywell shown by a preponderance of the evidence [15] that Hamilton Sundstrand APS 3200 product [16] infringes Claim 4 of the '194 patent under the [17] doctrine of equivalents?

[18] And the answer is yes, too. [19] Then we go to Claim 8 of the '893 [20] patent, that's the apparatus patent, that's the [21] one that covers the mechanism for doing this. And [22] again, they admit most of the elements are met.

[23] They admit that the APS 3200 has all [24] the things that they say here Sundstrand admits,

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[1] yes, or Sundstrand's expert admits yes. [2] As you can see there is two in [3] dispute. Five out of seven they agree. The other [4] two they take issue with.

[5] And the first one talks about [6] sensing means for sensing the value of a [7] predetermined, flow-related parameter within said [8] duct means, et cetera, et cetera.

[9] We've already been through that, [10] haven't we, that's DELPQP or Delta P over P and [11] the evidence that I mentioned a little while ago [12] about the sensing and the duct. So I mean, it's [13] the same evidence, same proof.

[14] And you'll remember that was also [15] the testimony that I put up or the admission from [16] Mr. Greubel, the guy who they brought in and said, [17] hey, I did this.

[18] And then this says further that the [19]

flow-related parameter being substantially [20] independent of the temperature of the compressed [21] air. So there is temperature in there, let's talk [22] about that because I don't want you to think I [23] skipped over that.

[24] Mr. Muller testified in the last

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[1] part of claim D, part D of Claim 8:

[2] "Is said value of said flow-related [3] parameter being substantially independent of the [4] temperature of the compressed air, is that part [5] also met by the appears 3200?

[6] **ANSWER:** Yes. [7] And for Mr. Ziegler's benefit, [8] that's at 644. I think it's right on there. We [9] put it on there so we don't have to worry about [10] trying to find it.

[11] The next, element E, Sundstrand [12] admits that.

[13] Next element is element F, that's [14] the one that they dispute. Varying set point as a [15] function of the position of inlet guide vanes.

[16] We admit, they don't do it exactly [17] the same way that the patent calls for, but they [18] do it in a way that's not substantially different [19] and we talked about that already. I already put [20] that evidence up with respect to how the [21] flow-related parameter and the surge set point are [22] functions and related to the inlet guide vane [23] position.

[24] Also, in addition, they have the

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[1] high flow/low flow and the inlet guide vanes used [2] to switch back and forth to that, you remember all [3] about that.

[4] So those are the two elements that [5] they dispute on Claim 8.

[6] Now, remember we also have claims 10 [7] and 11 in the case, those are the dependent [8] claims. Those are the ones that are dependent on [9] Claim 8. You got to meet all the elements of [10] Claim 8, they admit.

[11] I think you remember Mr. Shinsky [12] admitting this, if they infringe Claim 8 they have [13] the extra element of Claim 10, and the extra [14] element of Claim 11. They don't argue that they [15] don't. They admit if they infringe Claim 8, they [16] also infringe Claim 10 and 11.

[17] Then we go to claim 19, and again, [18] out of all the elements in Claim 19, we have got [19] eight elements there, I think, I think I counted [20] them up right. They admit they have six of them, [21] so the only ones you have to worry about are two.

[22] Element B, well, that looks [23] familiar. A sensing device having a sensing [24] portion adapted to be positioned in

the duct to

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[1] sense there in a predetermined parameter related [2] to the air flow rate through the duct, said [3] sensing device further having an output portion.

[4] We've already been through that. We [5] had Delta P over P, that's the flow-related [6] parameter, and I showed the evidence with respect [7] to — their witnesses admit that it's measured in [8] the duct.

[9] And Mr. Muller testified to that as [10] well. Then we have, what's the next one, it's [11] element G. They admit C, D, E and F. Let me get [12] down to G, a guide vane position sensor and a [13] function generator coupled in series between the [14] inlet guide vanes and said input portion of said [15] comparator.

[16] We talked about this already. The [17] flow-related parameter DELPQP is a function or [18] related to inlet guide vane position. There is no [19] question they have a guide vane position sensor. [20] We talked about that with everybody, everybody [21] agrees they have a sensor. The question is, what [22] do they do with it? [23] And they use it in part to develop [24] their DELPQP, or Delta P over P and the surge set

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[1] point. So that takes care of that. There is no [2] question, I think, about the input to the [3] comparator. We have got testimony from that and [4] there was a drawing that showed it and Mr. Muller [5] talked all about that.

[6] Then we go to dependent Claim 23, [7] and again dependent Claim 23 is just an extra [8] element to Claim 19, and they admit that if we [9] infringe — or if they infringe Claim 19 they also [10] infringe Claim 23. Remember, to win, all we have [11] to do is win one claim.

[12] You may ask why did we put in all [13] these other ones, that was partly because of the [14] invalidity arguments. We wanted to deal with [15] fairly with the two patents that way, but all we [16] have to win on is one.

[17] So the next question on the jury [18] verdict form, question number three, Has Honeywell [19] shown by a preponderance of the evidence that [20] Hamilton Sundstrand's APS 3200 product infringes [21] any of the following claims of the '893 patent [22] under the doctrine of equivalents?

[23] And again, I've put the X's there to [24] indicate that we think we have.

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[1] Again, this is preponderance of the [2] evidence, remember. If the scales tilt a little [3] bit in our favor, then we win.

point had on the [13] screen, on the big screen element 4D and he had [14] been previously going through the claim, all the [15] elements and asking questions that related to the [16] language in the elements.

[17] And then he put up element 4D. But [18] when he asked the question that I thought was [19] coming about element 4D, he changed the question. [20] He did not track the language of 4D. He [21] substituted questions that you heard just now.

[22] So that there was no statement by [23] Mr. Shinskey that this is satisfied. This is not [24] satisfied and that's exactly what he said.

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[1] Now, conversely, Mr. Muller gave [2] testimony about these same issues. And you may [3] recall on cross-examination by Mr. Herrington that [4] he was asked a key question about this Claim 4.

[5] He was asked because the 3200 does [6] not do this, it doesn't adjust the relationship [7] between the magnitudes of the integral and [8] proportional control signals that are used to [9] operate the bleed valve in accordance with IGV [10] position.

[11] Mr. Herrington asked Mr. Muller, [12] doesn't he agree that the control signals at issue [13] here have to be used to operate the bleed valve, [14] just as it says in Claim 4C.

[15] And this was what Mr. Muller [16] responded. I'm going to read it to you. It went [17] like this, this is page, starting at page 757, [18] line eight of the transcript, this is [19] Mr. Herrington of Mr. Muller.

[20] QUESTION: Now, in your opinion is [21] that requirement that to utilize the integral and [22] proportional control signals to operate the surge [23] bleed valve require that the system actually [24] utilizes the proportional and integral signals to

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[1] operate the bleed valve?"

[2] A pretty straightforward question. [3] What it says in the claim that those [4] signals have to — are used to operate the surge [5] bleed valve, do you agree that's what it means, [6] Mr. Muller?

[7] This is what he said.

[8] "ANSWER: What it says — what it [9] says is that this is a provision which basically [10] states that the integral and proportional control [11] signals simultaneously generated control to [12] operate — let me just — it's the way the wording [13] is phrased here. Yes, what it refers to, it [14] basically just refers to the generation of these [15] signals and then it says — and basically it says [16] these signals are generated to operate the

valve [17] and, in fact, that's what occurs."

[18] And Mr. Herrington persisted to see [19] if he can get a clear response from Mr. Muller so [20] he asked the following question:

[21] "QUESTION: My question is, where it [22] says utilizing said integral and proportional [23] control signals to operate said surge bleed valve, [24] does that necessarily require that the integral

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[1] and proportional control signals are used to [2] operate the said surge bleed valve?"

[3] And this is what Mr. Muller said the [4] next time.

[5] "ANSWER: What it says is that [6] these valves are generated to operate the valve. [7] It does not say to what extent they're operated, [8] over what range. It just simply states that the [9] flow parameter is used, fed through a proportional [10] and integral controller to generate a signal that [11] is available to the bleed control valve, or to a [12] surge control valve, or in the case to a surge [13] bleed valve as the wording in the patent."

[14] Mr. Herrington tried again.

[15] "QUESTION: Just to be clear, it [16] states utilizing said integral and proportional [17] control signals to operate said surge bleed [18] valves?"

[19] "ANSWER: Yes, which is exactly [20] what it does.

[21] "QUESTION: Does it require that [22] they be utilized to operate the said bleed valve?

[23] "ANSWER: It says nothing here [24] about when it's used and to what extent it's

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[1] used. It basically says that it's available to be [2] used to operate these, the surge bleed valves.

[3] "QUESTION: So a system — could in [4] your view satisfy about this language by not [5] utilizing said integral and proportional control [6] signals to operate said surge bleed valve."

[7] Mr. Herrington is saying utilizing [8] to operate the bleed valve. He's asking Muller: [9] Could that be satisfied by not doing that?

[10] "ANSWER: This language does not [11] put constraint to the utilization of the signals [12] widely proportional and integral controllers to [13] operate the said bleed control valve. It actually [14] states that they be available to be used to [15] operate the surge bleed valve.

[16] "That's the extent of what the [17] statement says in my reading. I mean, I can see [18] where there could be disagreement on that, but [19] that's the way I read that."

[20] Now, ladies and gentlemen, there is [21] disagreement on that, and it's not simply [22] disagreement from me.

[23] If you would turn to your copy of [24] the Judge's charge, jury instructions from

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[1] yesterday to page 18, you will see that among the [2] instructions the Judge gave you on page 18 was he [3] explained what 4C means in this regard.

[4] And he gave this straightforward [5] interpretation that utilizing those PI signals to [6] operate the bleed valve means those PI signals are [7] utilized to operate the bleed valve.

[8] Mr. Muller disagrees with that. It [9] may be his right to disagree with that, but you [10] have no right to disregard the Judge's [11] instruction. You are bound by it.

[12] So Mr. Muller's analysis of [13] infringement here, at least on Claim 4, is based [14] on an interpretation of the patent claim that is [15] wrong.

[16] The balance of Mr. Muller's [17] testimony was of a piece with the portion that I [18] read for too long, but it was not [19] straightforward. It was not clear. It did not [20] hang together. It was what it was. It went on at [21] great length, and at the end of the day he [22] certainly, in response to Mr. Putnam's questions, [23] dutifully gave the opinion, yes, these elements [24] are satisfied. Yes, there is infringement here,

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[1] but it didn't make any sense.

[2] It wasn't tethered to the claims. [3] You may recall, chances are you [4] don't, it's my job to remind you, that in [5] analyzing claims, it was either 8 or 19 that talks [6] about requiring IGV position to be an input into a [7] comparator. He referred to one of their nice [8] charts as the comparator is here, and then to say [9] that IGV position was an input to the comparator, [10] he had to go to a different chart and say, well, [11] there is another comparator over there that IGV is [12] an input to. But there is no comparator over [13] there, and Mr. Shinskey testified to that [14] clearly.

[15] Mr. Shinskey is a fellow with [16] decades of experience and knowledge about [17] controlling compressors. And as you know, has [18] written books and articles, and has been invited [19] to 50 different nations around the world to give [20] lectures about controlling compressors.

[21] He's the real McCoy. He's a genuine [22] expert. He knows what he's talking about.

[23] Mr. Muller is a man who lists [24] himself with a lawyer's service on a